EXHIBIT A

Exhibit A – Proposed Constructions for Terms in Dispute

Term	Asserted Claims	Claim Term or Phrase	Corephotonics' Proposed Constructions and Citations to Evidence	Apple Proposed Constructions and Citations to Evidence
1	'032 cl. 1 '712 cl. 1, 15, 19 '568 cl. 1 '291 cl. 6	"total track length (TTL)" / "total length (TTL)"	length on an optical axis between the object-side surface of the first lens element and the electronic sensor **Intrinsic Evidence** '032 pat., 1:23-30, 1:60-2:7, 1:61-63-2:21, 4:35-54, 5:50-6:2, 7:15-33; Figs. 1A, 2A, 3A. '712 pat., 1:25-34, 1:62-2:20, 4:39-59, 5:57-6:8, 7:29-46; Figs 1A, 2A, 3A. '568 pat., 1:29-36, 2:1-15, 2:17-29, 5:1-23, 6:43-56, 7:63-8:16; Figs. 1A, 2A, 3A. '291 pat., 1:13-15, 6:37-43, 12:14-37; Figs. 1B, 8, 9. *See also* cited reference U.S. 8,310,768 at 2:8-10, 3:48-51; cited reference U.S. 8,395,851 at 1:66-2:1, 2:20-23. **Extrinsic Evidence** ZEMAX® Optical Design Program User's Manual, July 8, 2011, at 60. Sunny Optics, "How to select a lens," *available at*	length on an optical axis between the object-side surface of the first lens element and the image plane **Intrinsic Evidence** '032 pat., 1:27-30, 1:32-38, 1:55-66, 2:9-25, 2:61-3:15, 4:35-5-11, 5:50-27, 7:15-33; Figure 1A, 2A, 3A; claims 1, 8, 18. '712 pat., 1:29-32, 1:35-40, 1:57-2:1, 2:10-29, 3:11-16, 4:60-5:17, 5:57-6:34, 7:29-46; Figures 1A, 2A, 3A; claims 1, 8, 16. '568 pat., 1:33-36, 1:40-45, 1:63-2:8, 2:17-29, 2:46-49, 3:37-42, 5:1-65, 6:43-56, 6:65-7:22, 7:63-8:16; Figures 1A, 2A, 3A; claim 1. '291 pat., 4:1-3, 4:60-62, 12:14-37, Figs. 8, 9; claims 1, 6-7. *See also*, cited reference U.S. 8,395,851, at Figure 1, 8:42-48; cited reference U.S. 8,310,768, at 2:27-47, 5:49-57. 291 patent file history, COREPH000793-COREPH001273, at COREPH000963 and 970.

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			http://www.lensworking.com/ sunnyoptics6_4asp?num=269. U.S. Patent App. Pub. No. 2013/0229570 at ¶ 100, 102, 104-06. 109; Fig. 14, 15.	**Extrinsic Evidence** Bareau, "The Optics of Miniature Digital Camera Modules" ("Bareau I") at 1. Bareau, "The Optics of Miniature Digital Camera Modules" ("Bareau II") at 12545, 12549-550, 12552 (APPL_COREP_00012543-12553). Kingslake, "History of the Photographic Lens," at 132 (APPL_COREP_00014364-14502, at 14495). Kingslake, "Lens Design Fundamentals," at 259-260. Cox, "System of Optical Design, at 455. Malacara, "Handbook of Lens Design," at 385. U.S. 9,223,118, at Abstract; Figures 1, 3, 5, 7, 11, 13; 1:56-67, 5:39-62, 10:46-53, 13:24-33, 14:63- 15:4, 19:55-58, 20:28-32

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				U.S. 7,474,480, at 2:14-20, 6:9-12, 7:31-36, 8:25-30, 9:16-21, 10:6-12. U.S. 7,564,635, at Figures 1, 3, 5; 2:9-14; 4:45-5:8; 7:15-46; 9:36-64. U.S. 5,172,275, at 11:23-27. U.S. 4,474,459, at 7:58-60. U.S. 3,604,787, at 1:29-36. U.S. 4,329,026, at 52:63-53:3. ZEMAX® Optical Design Program User's Manual, July 8, 2011, at 60, 75, 77, 84. Sunex Inc., specifications, e.g., *available at* http://www.optics-online.com/OOL/DSL/DSL235.PDF, http://www.optics-online.com/OOL/DSL/DSL756.PDF. Shanghai Optics, "Build Your Own Lens," *available at* https://www.shanghai-optics.com/how-to-order/build-your-own-lens/.

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2	'152 cl. 1, 3	standard color filter array (CFA)	a color filter array (CFA) that includes a RGB (Bayer) pattern or a non-Bayer pattern such as RGBE, CYYM, CYGM, RGBW#1, RGBW#2 or RGBW#3 **Intrinsic Evidence** '152 pat., Abstract, 2:43-46, 3:25-36, 4:12-24, 5:32-59, 6:27-7:8; Figs. 1B, 2-9, 11B.	a color filter array (CFA) including a RGB (Bayer) pattern, RGBE, CYYM, CYGM, RGBW#1, RGBW#2, or RGBW#3 **Intrinsic Evidence** '152 patent, Abstract, 2:37-63, 3:25-40, 3:56-61, 5:40-44, 5:51-55, 6:2-18, 6:27-32, 6:44-49, 6:63-7:47, 7:51-55, 7:66-8:2, 8:12-14, 8:21-26, 8:41-45, 8:53-54, 12:13-26, 12:32-35, 12:46-55, Figs. 1-9, 11B. '152 pat. 5/17/2016 Office Action, Response to 5/17/2016 Office Action.
3	'152 cl. 1, 3	register the overlap area of the second image as non-primary image to the first image as primary image	Corephotonics has proposed a construction for this term in its full context, *see* the row below.	map the overlap area of the second image as the non-primary image to the first image as the primary image, by finding correspondences between the pixels in the two images for the overlap area. **Intrinsic Evidence** '152 patent, 3:47-49, 3:56-4:11, 4:26-50, 8:2-3, 9:13-44 '152 pat. 5/17/2016 Office Action, Response to 5/17/2016 Office Action, 11/10/2016 Examiner-

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				Initiated Interview Summary, Notice of Allowance.
4	'152 cl. 1, 3	to register the overlap area of the second image as non-primary image to the first image as primary image to obtain the output image	to map the overlap area of the second image as the non-primary image to first image as the primary image, finding correspondences between the pixels in the two images for the overlap area, to form the output image using information from the non-primary and primary images together with the mapping information of the non-primary image to the primary image for the overlap area **Intrinsic Evidence** '152 pat. 3:56-67, 4:12-24, 4:36-45; 5:40-6:15, 8:2-29, 9:20-26, 9:43-10:14, 12:60-13:4, 13:14-17, 13:20-14:9, 14:20-22; Figs. 1A, 1B, 10, 11A; '152 pat. Response to 5/17/2016 Office Action, 11/10/2016 Examiner-Initiated Interview Summary, Notice of Allowance.	Apple proposes that the phrase requiring construction is provided in term 3 above, and "to obtain the output image" is an objective of the claimed registration and is not a limitation requiring construction. **Intrinsic Evidence** '152 patent, 9:45-11:67; *see also* evidence in term 3 above.
5	'291 cl. 1, 12	fused output image of the object or scene from a particular	"output image of the object or scene from a particular point of view" means that "the object and scenes of the output image have the position	an output image of an object or scene, that, whether from the Wide or Tele point of view, includes both Wide and Tele image data

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		point of view	and shape as would be seen from a defined point of view of one of the Wide or Tele lens" "a fused output image of an object or scene from a particular point of view" means "an output image that: if from the Wide point of view (POV), combines wide image data and that tele image data that corresponds to wide image data, such that the object or scenes of the output image have the position and shape as would be seen from the Wide lens, if from the Tele POV, combines tele image data and that wide image data that corresponds to tele image data, such that the object or scenes of the output image have the position and shape as would be seen from the Tele lens" **Intrinsic Evidence** '291 pat., 3:34-41, 3:48-60, 4:60-5:13, 9:15-36, 9:52-67; Fig. 1B, 2.	**Intrinsic Evidence** '291 Pat., 3:35-41, 3:51-60, 4:60-5:13, 5:5-11, 9:15-36, 9:44-10:10; Figure 5. **Extrinsic Evidence** '152 Pat., Abstract, 6:20-26, 9:22-30; Claims 1-4. '152 pat. 5/17/2016 Office Action, Response to 5/17/2016 Office Action, 11/10/2016 Examiner-Initiated Interview Summary, Notice of Allowance.
6	'291 cl. 4, 5, 13	sensor oversampling ratio	the ratio of the in-line (i.e. in a line) number of sensor pixels and in-line number of output video format pixels	no construction is necessary, but if the Court determines construction is required, Apple would propose:

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			Intrinsic Evidence '291 pat., 6:58-61, 7:12-18; cl. 4, 5, 13.	"the ratio of the in-line (i.e. in a line) number of sensor pixels in the Wide sensor to the in-line number of output video format pixels" **Intrinsic Evidence** '291 pat., 6:58-7:23.